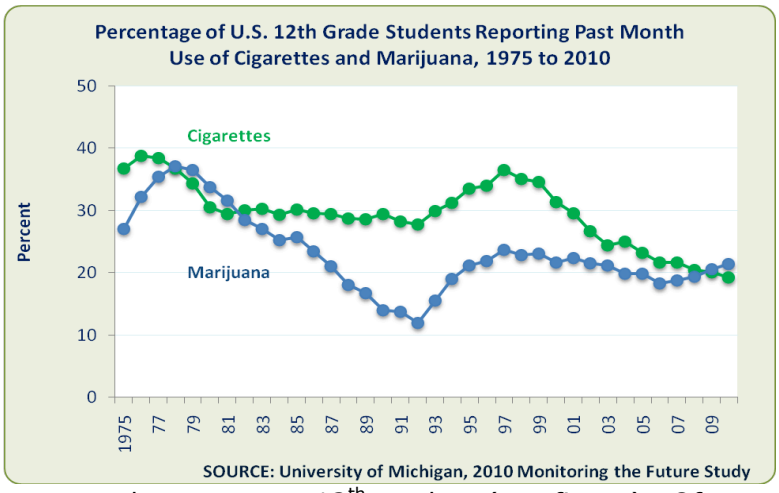
Topics in Brief
National Institute on Drug Abuse
NIDA
NATIONAL INSTITUTE ON DRUG ABUSE

Marijuana—February, 2011

An Update from the National Institute on Drug Abuse

Marijuana Abuse in the United States

In 2009, more than 28 million Americans (11.3%) aged 12 or older reported abusing marijuana within the past year and 4.3 million met DSM-IV criteria for abuse or dependence (addiction). Beginning in the mid-1990's, NIDA's Monitoring the Future study showed a consistent decline in marijuana use among 8th, 10th, and 12th graders. In the past few years this trend has stalled, and increases were reported in 2010 among 8th graders for past month and past year use. Past month use was 8.0% in 8th graders, 16.7% in 10th graders, and 21.4% in 12th graders, or 1 in 5 seniors. In fact, marijuana now exceeds tobacco in reported past month use among 12th graders (see figure). Of even greater concern is the increased rate of *daily marijuana use*, reported in all three grades. For 12th graders, 6.1% represents the highest prevalence rate for daily marijuana use reported since the early 1980's.



Marijuana's Effects

Marijuana is derived from plant containing more than 400 chemical constituents. Tetrahydrocannabinol (THC) is the main psychoactive ingredient in marijuana. It binds to cannabinoid (CB) receptors, widely distributed throughout the nervous system, and other parts of the body. In the brain, CB receptors are found in high concentrations in areas that influence pleasure, memory, thought, concentration, sensory and time perception, appetite, pain, and movement coordination. This is why marijuana can have wide ranging effects, including:

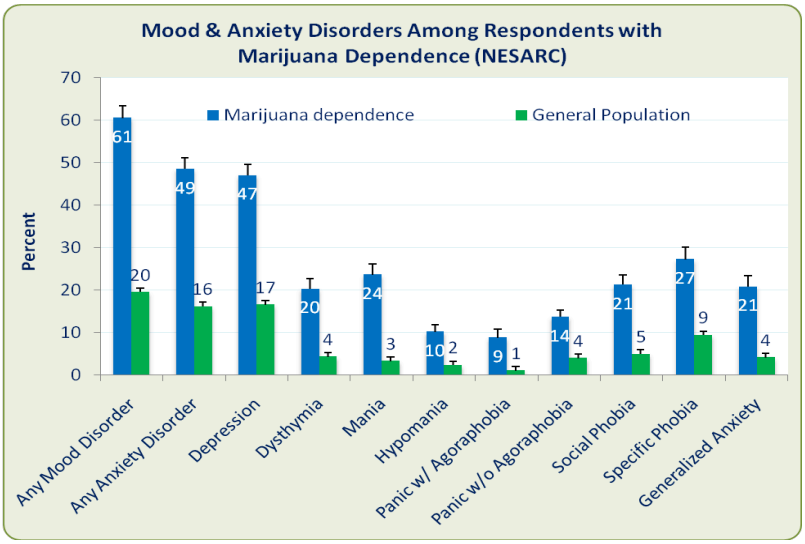
- Impaired short-term memory (memory of recent events)--making it hard to learn and retain information, particularly complex tasks.
- Slowed reaction time and impaired motor coordination—throwing off athletic performance, impairing driving skills, and increasing the risk of injuries
- Altered judgment and decisionmaking—possibly leading to high-risk sexual behaviors that could lead to the spread of sexually transmitted diseases.
- Increased heart rate by 20-100%--may increase the risk of heart attack, especially in otherwise vulnerable individuals
- Altered mood--euphoria, calmness, or in high doses, anxiety, paranoia
- *Exposure during critical developmental periods*: From animal research, THC exposure pre- or perinatally or during adolescence can alter brain development, particularly in areas related to mood, reward, and executive function (e.g., cognitive flexibility)

<u>Long term marijuana abuse:</u>

- Risk of addiction
- Poorer educational outcomes and job performance, diminished life satisfaction
- Respiratory problems—chronic cough, bronchitis
- Risk of psychosis in vulnerable individuals
- Cognitive impairment persisting beyond the time of intoxication

Marijuana and Mental Illness

People who are *dependent* on marijuana frequently have other comorbid mental disorders (see figure). Population studies reveal an association between cannabis use and increased risk of schizophrenia and, to a lesser extent, depression, and anxiety. There are now sufficient data indicating that marijuana may trigger the onset or relapse of schizophrenia in people predisposed to it, perhaps also intensifying their symptoms.



Marijuana and Addiction

Long-term marijuana use can lead to addiction; that is, people use the drug compulsively even though it interferes with family, school, work, and recreational activities. According to NSDUH, in 2009 of the estimated 7.1 million Americans classified with dependence on or abuse of illicit drugs, 4.3 million were dependent on or abused marijuana. Research has shown that approximately 9% of people who used marijuana may become dependent. The risk of addiction goes up to about 1 in 6 among those who start using as adolescents, and 25-50% of daily users. In 2008, 17% of people entering drug abuse treatment programs reported marijuana as their primary drug of abuse (63% of those aged 12-14; and 69% of those 15-17), representing more than 320,000 admissions (TEDS, 2008). Along with craving, withdrawal symptoms such as irritability, sleeping problems, and anxiety can make it difficult for long-term marijuana smokers to quit.

Treatment for Marijuana Addiction

Behavioral interventions, including cognitive-behavioral therapy and motivational incentives (i.e., providing vouchers for goods or services to patients who remain abstinent) have shown moderate efficacy in treating marijuana dependence. Although no medications are currently available, recent discoveries about the workings of the cannabinoid system offer promise for the development of medications to ease withdrawal, block the intoxicating effects of marijuana, and prevent relapse.

Marijuana as Medicine

The potential medicinal properties of marijuana have been the subject of substantive research and heated debate. And while marijuana is not an FDA approved medicine, 14 states and the District of Columbia have currently legalized its medical use. Scientists have confirmed that the cannabis plant contains active ingredients with therapeutic potential for relieving pain, controlling nausea, stimulating appetite, and decreasing ocular pressure. As a result, a 1999 Institute of Medicine report concluded that further research on cannabinoid drugs and safe delivery systems was warranted.

Marijuana itself is an unlikely medication candidate for several reasons: (1) it is an unpurified plant containing numerous chemicals with unknown health effects; (2) it is typically consumed by smoking further contributing to potential adverse effects; and (3) its cognitive impairing effects may limit its utility. The promise lies instead in designing tailored medications, developed from marijuana's active components, for specific conditions or symptoms with improved risk/benefit profiles. Scientists are actively engaged in this pursuit and hope to bring to market a new generation of safe and effective medications that avoid the adverse effects of smoked marijuana.

For more information please visit NIDA on the web at www.drugabuse.gov or contact:
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